DELAY-LOCKED LOOP CIRCUIT AND METHOD USING A RING OSCILLATOR AND COUNTER-BASED DELAY

ABSTRACT OF THE DISCLOSURE

A delay-locked loop includes a ring oscillator that generates a plurality of tap clock signals, with one tap clock signal being designated an oscillator clock signal. Each tap clock signal has a respective delay relative to the oscillator clock signal. The oscillator clock signal clocks a coarse delay counter to develop a coarse delay count that determines a coarse delay of a delayed clock signal. A fine delay of the delayed clock signal is determined by selecting one of the tap clock signals of the ring oscillator. The phase between an input clock signal and the delayed clock signal is determined and the coarse and fine delays adjusted in response to this phase to synchronize the delayed and input clock signals. The delay-locked loop may also monitor rising and falling edges of the input clock signal and develop corresponding rising-edge and falling-edge fine delays to synchronize rising and falling edges of the input clock signal.